

What is claimed is:

1. A semiconductor integrated circuit having a built-in power supply circuit which, receiving an external source voltage, generates a positive voltage higher than the external source voltage and a negative voltage lower than a ground potential, the semiconductor integrated circuit comprising a switch element connected between first wiring for feeding said negative voltage as a bias voltage for a substrate and second wiring for supplying the ground potential.

2. The semiconductor integrated circuit according to Claim 1, wherein said switch element is temporarily made to conduct at the time of starting up the power supply circuit to set the potential of the substrate, to which the negative voltage is to be applied, temporarily to the ground potential.

3. The semiconductor integrated circuit according to Claim 2, further comprising a reset circuit for generating a control signal to make said switch element conduct temporarily in accordance with another control signal for starting up said power supply circuit.

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~~4. The semiconductor integrated circuit according to any of Claims 1 through 3, wherein said switch element is comprised of a high voltage withstand MOSFET.~~

5. A liquid crystal display control unit integrated into a semiconductor circuit provided with a power supply circuit for liquid crystal display driver which, receiving an

external source voltage, generates a voltage to be applied to segment electrodes of a liquid crystal panel, a positive voltage, higher than said external source voltage, to be applied to common electrodes of said liquid crystal panel and a negative voltage lower than a ground potential, further comprising:

a switch element connected between first wiring for feeding said negative voltage as a bias voltage for a substrate and second wiring for supplying the ground potential.

6. The liquid crystal display control unit according to Claim 5, wherein said switch element is temporarily made to conduct at the time of starting up the power supply circuit to set the potential of the substrate, to which the negative voltage is to be applied, temporarily to the ground potential.

7. The liquid crystal display control unit according to Claim 6, further comprising a reset circuit for generating a control signal to make said switch element conduct temporarily in accordance with another control signal for starting up said power supply circuit.

*Sub A* ~~8.~~ The liquid crystal display control unit according to any of Claims 5 through 7, wherein said switch element is comprised of a high voltage withstand MOSFET.

9. The liquid crystal display control unit according to Claim 8, further comprising a segment drive circuit for supplying signals for driving segment electrodes of the liquid

crystal panel on the basis of a voltage generated by said power supply circuit and a common drive circuit for signals for driving common electrodes of the liquid crystal panel on the basis of a voltage generated by said power supply circuit,

wherein elements constituting said common drive circuit are comprised of MOSFETs higher in voltage withstand than the elements constituting said power supply circuit for liquid crystal display driver, and said switch element is comprised of a voltage withstand MOSFET having the same structure as the elements constituting said common drive circuit.

10. The liquid crystal display control unit according to any of Claims 5 through 9, further comprising a first operating mode in which liquid crystal displaying is performed in a state of a source voltage being supplied from outside and a second operating mode in which liquid crystal displaying is not performed in a state of a source voltage being supplied from outside,

wherein, when shifting from said second operating mode to the first operating mode, said switch element is temporarily made to conduct to temporarily apply the ground potential to the substrate, to which the negative voltage should be applied.

11. The liquid crystal display control unit according to any of Claims 5 through 10, further comprising an oscillating circuit, a first operating mode in which said oscillating circuit is operated to perform liquid crystal displaying in

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a state of a source voltage being supplied from outside and a third operating mode in which the operation of said oscillating circuit is stopped not to perform liquid crystal displaying in a state of a source voltage being supplied from outside, wherein, when shifting from said third operating mode to the first operating mode, said switch element is temporarily made conduct to set the potential of the substrate, to which the negative voltage is to be applied, temporarily to the ground potential.

12. The liquid crystal display control unit according to Claim 5, further comprising an external terminal to which a signal for on/off control of said switch element is inputted.

13. Mobile electric equipment comprising:

the liquid crystal display control unit according to any of Claims 5 through 12;

a liquid crystal panel to perform displaying in a dot matrix system in accordance with a signal generated by said segment drive circuit and a signal generated by said common electrode drive circuit; and

a battery for providing the source voltage of said liquid crystal display control unit.

14. Mobile electric equipment comprising:

a power supply circuit for liquid crystal display driver which, receiving an external source voltage, generates a voltage to be applied to segment electrodes of a liquid crystal

panel, a positive voltage, higher than said external source voltage, to be applied to common electrodes of said liquid crystal panel and a negative voltage lower than a ground potential;

a switch element connected between first wiring for feeding said negative voltage as a bias voltage for a substrate and second wiring for supplying the ground potential;

a control unit for controlling said liquid crystal display control unit;

a liquid crystal panel to perform displaying in a dot matrix system in accordance with segment electrode drive signals and common electrode drive signals generated by said liquid crystal display control unit; and

a battery for providing the source voltage of said liquid crystal display control unit,

wherein a signal for on/off control of said switch element is supplied from said control unit to said external terminal of said liquid crystal display control unit.